

REMARKS

Claims 2-7, 9-16, and 26-29 are pending. Claims 17 and 18 are withdrawn from consideration. Claims 3 and 26 have been amended.

The Examiner rejected claims 3-7, 9-11, 13, and 26-28 under 35 U.S.C. 112, second paragraph, as being indefinite. The Examiner stated that claims 3 and 26 recite limitations with insufficient antecedent basis. Claims 3 and 26 have been amended accordingly.

The Examiner rejected claims 2, 12, 14-16, and 29 under 35 U.S.C. 102, as being anticipated by Dandl (U.S. Patent 5,370,765).

Claim 2 recites that the magnetic elements are disposed around and extend along the plasma region. Page 10, lines 28 to 32, describe how the magnetic elements 702 in FIG. 2 extend along the plasma region, which is substantially from the chuck 314 to the window 308. In addition, page 17, lines 16 to 18, of the application further states that the magnetic elements 550 are disposed along the plasma region, referring to FIG 6. Here the magnetic elements are in a ring shape as disclosed in Dandl. Instead of stating that the rings extend along the plasma region, the application states that they are disposed along the plasma region. The magnets of Dandl may be disposed along the plasma region as shown in FIG. 6 of the present application, but none of the magnets in Dandl extend along the plasma region as recited in claim 2 and shown in FIG. 2 of the present application. Nothing in Dandl suggests magnets that extend along the plasma region. In addition, the magnetic elements are not within the plasma region within the process chamber, as recited in claim 2. Instead, the magnets of Dandl form the outer sides of the plasma region, as shown in FIG. 1 of Dandl. For at least these reasons, claim 2 is not anticipated by Dandl.

Claims 12, 14-16, and 29 each depend either directly or indirectly from independent claim 2, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to independent claims. Additionally, these dependent claims require additional elements that when taken in the context of the claimed invention, further patentably distinguish the art of record. For example, claim 14 further recites that the magnetic elements are within sleeves. The bands 51 described in col. 13, lines

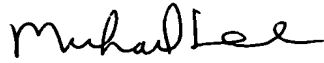
20-32, are flat bands on one side of the magnets as shown in Fig. 2 of Dandl, and are not sleeves. Claim 15 further recites that at least one of the magnetic elements is moved so that the magnetic field shifts over time. Claim 16 recites that the magnetic elements are rotated. The Examiner failed to specifically point out anything in Dandl that teaches moving a magnetic element or rotating the magnetic elements. In addition, claim 29 recites that the plasma is able to fill the entire process chamber in which the magnetic elements are disposed. Again, in Fig. 1 of Dandl the magnets are not disposed within the chamber that is filled with plasma. For at least these reasons, claims 12, 14-16, and 29 are not anticipated by Dandl.

The Examiner rejected claims 3-7, 9-11, 13, and 26-28 under 35 U.S.C. 103 (a) as being unpatentable over Dandl (U.S. Patent 5,370,765). Claims 3-7, 9-11, 13, and 26-28 each depend either directly or indirectly from the independent claim, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to independent claim. Additionally, these dependent claims require additional elements that when taken in the context of the claimed invention, further patentably distinguish the art of record. For example, claim 3 recites that the plurality of magnetic elements extends substantially from a first end of the process chamber to a chuck. As discussed above regarding claim 2, Dandl shows magnets being disposed between the first end and the chuck, but does not show magnets extending from the first end to the chuck. In addition, claim 9 recites the magnetic elements are individually contained in sleeves. The magnets in FIG. 1 of Dandle are not individually contained in sleeves. In addition, claim 11 recites that the magnetic elements are rotated. For at least these reasons, claims 3-7, 10-12, 15, 16, and 26-29 are not anticipated or made obvious by the cited references.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe

that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (831) 655-2300.

Respectfully submitted,
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A handwritten signature in black ink, appearing to read "Michael Lee". The signature is fluid and cursive, with the first name "Michael" and last name "Lee" clearly distinguishable.

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CLEAN VERSION OF PENDING CLAIMS

2. (Twice Amended) A plasma processing apparatus for processing a substrate, comprising:

a process chamber, comprising:

a wall defining part of the process chamber;

a device for igniting and sustaining within the process chamber a plasma for said processing; and

a plasma confinement arrangement comprising a magnetic array having a plurality of magnetic elements that are disposed within said process chamber, said plurality of magnetic elements being configured to produce a magnetic field, and wherein said plurality of magnetic elements are disposed around and extend along said plasma region, and wherein said magnetic elements are within said plasma region.

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3. (Once Amended) The apparatus, as recited in claim 2, wherein said plurality of magnetic elements extend substantially from a first end of said process chamber to a chuck.

4. The apparatus, as recited in claim 3, wherein said magnetic field has an azimuthally symmetric radial gradient.

5. The apparatus, as recited in claim 4, wherein each magnetic element has a physical axis which extends along the plasma region.

6. The apparatus, as recited in claim 5, wherein each magnetic element has a magnetic axis which is substantially perpendicular to the physical axis.

7. The apparatus, as recited in claim 5, wherein said magnetic elements are permanent magnets.

9. The apparatus, as recited in claim 5, wherein said magnetic elements are individually contained within sleeves.

10. The apparatus, as recited in claim 5, wherein at least one of said magnetic elements is moved so that said magnetic field shifts over time.

11. The apparatus, as recited in claim 5, wherein said magnetic elements are rotated.

12. The apparatus, as recited in claim 2, wherein said magnetic elements are permanent magnets.

13. (Once Amended) The apparatus, as recited in claim 9, wherein said sleeves shield said magnetic elements from plasma.

14. The apparatus, as recited in claim 2, wherein said magnetic elements are individually contained within sleeves.

15. The apparatus, as recited in claim 2, wherein at least one of said magnetic elements is moved so that said magnetic field shifts over time.

16. The apparatus, as recited in claim 2 wherein said magnetic elements are rotated.

17. (Once Amended) A method for controlling a volume of a plasma while processing a substrate in a process chamber, said chamber defined at least in part by a wall, using a plasma enhanced process, comprising:

producing a magnetic field inside said process chamber with a magnetic array located inside said chamber;

creating said plasma inside said process chamber; and

partially confining said plasma within a volume defined at least in part by said magnetic field.

18. The method, as recited in claim 17, further comprising the step of supporting the substrate on a chuck in the chamber, wherein the substrate is spaced apart from a first end of said process chamber, and wherein the plasma is substantially confined in a plasma region between said first end of said process chamber and said substrate, and wherein said magnetic

array, comprises a plurality of magnetic elements disposed around and extending along said plasma region between said first end of said process chamber and said substrate.

26. (Once Amended) The apparatus, as recited in claim 2, wherein at least one magnetic element extends substantially from a first end of said process chamber to a chuck.

27. The apparatus, as recited in claim 26, wherein the plurality of magnetic elements are disposed around and outside the periphery of the substrate.

28. The apparatus, as recited in claim 26, wherein the magnet elements are placed to create a minimum magnetic field at the substrate.

29. (Once Amended) The apparatus, as recited in claim 2, wherein the plasma is able to fill the entire process chamber in which the magnetic elements are disposed.